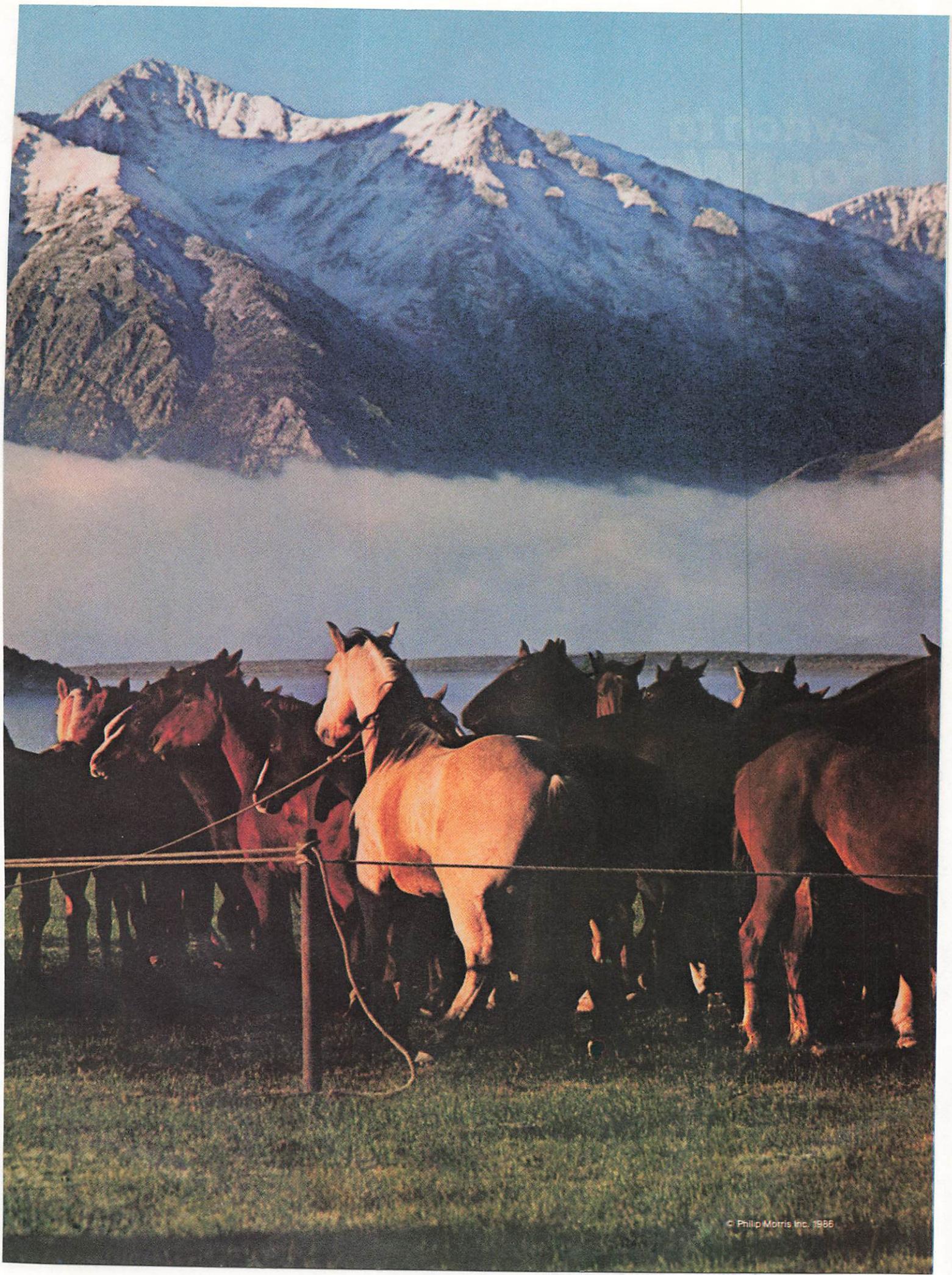


White-faced Herefords and their calves being driven by Utah cowboys

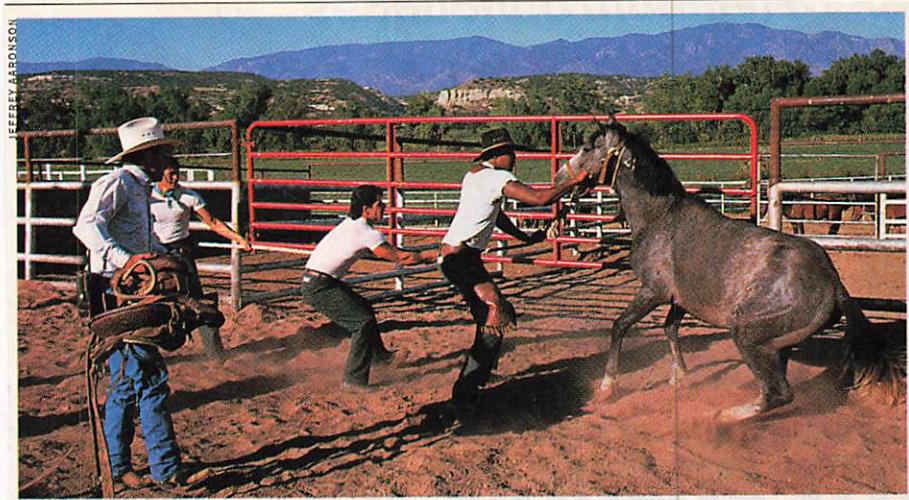
Photo — courtesy Utah Publicity Dept.





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At the state penitentiary in Cañon City, prisoners prepare to saddle break a mustang

These Cowboys Are Convicts

In Colorado, inmates learn to tame horses—and themselves

Under a big sky on the Colorado plains, Rory Robinson, doing five years for burglary, is uneasily making the acquaintance of a gray mare that once ran wild and free. Robinson and the mustang have much in common: both have been corralled in the Colorado State Prison to be tamed.

Tense beneath her first saddle and confined to a narrow chute, the mustang lays back her ears indignantly. Robinson, 28, tall and powerfully built, eases atop the animal, and she erupts in furious leaps. Fellow convicts pull Robinson to safety. Released into the corral, the mare kicks like a *ninja* assassin as cowboys in green prison garb shout and wave their Stetsons to keep her from banging into the fence. Robinson climbs on again and seconds later is bucked into the dust. Yet even a wild horse eventually tires. Another man mounts up, the mare crow-hops a bit, stiff-legged and snorting. But her fight is gone.

When Prison Superintendent Harry B. Johnson first heard of the proposal that convicts tame wild mustangs under the Federal Bureau of Land Management's nationwide "adopt a horse" program, he feared the only results would be "injuries and lawsuits." Now Johnson tells of hard-case cons transformed into amiable cowpokes. "They are proud of the horses and proud of what they can do," says he of the 30 men in the program.

Wild-horse enthusiasts are equally delighted. In 1985 the BLM rounded up 17,000 of the estimated 50,000 mustangs that have overgrazed public rangeland, mainly in Nevada and Wyoming. The bureau offered the horses for "adoption" at \$125 a head, but buyers found the animals unmanageable.



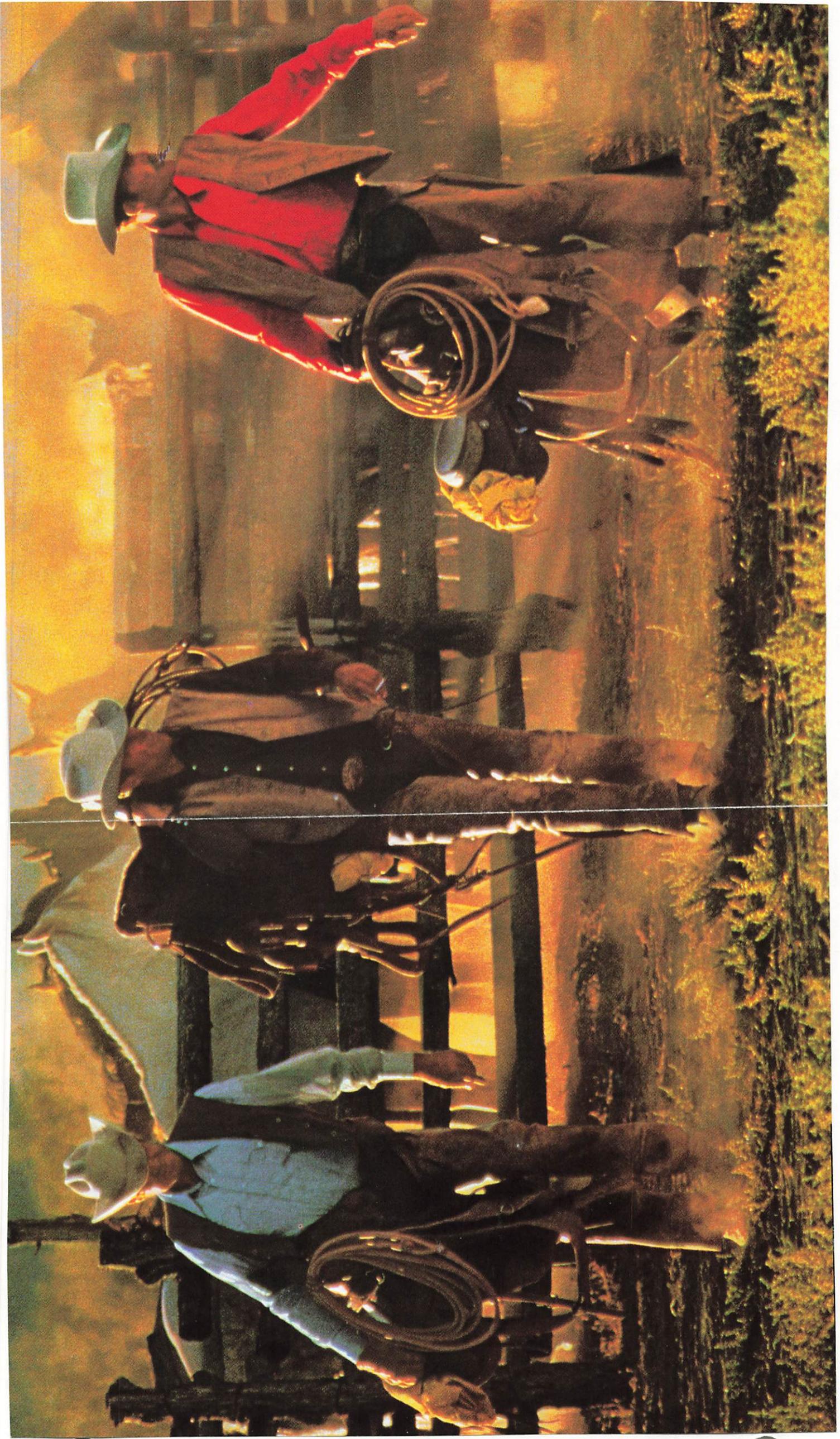
A school of hard knocks

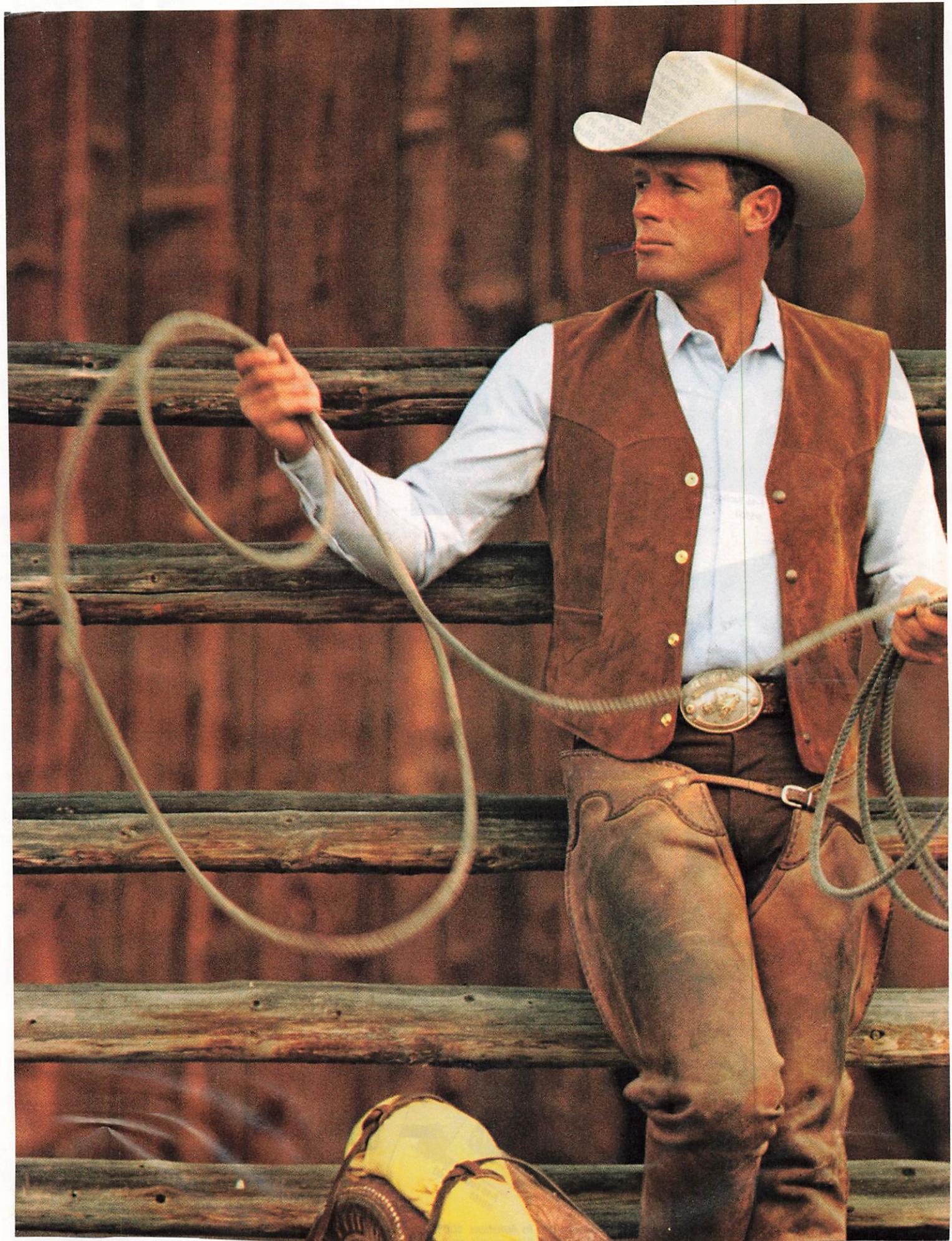
Last year BLM Range Conservationist Walter Jakubowski persuaded authorities at the Colorado State Prison complex in Cañon City to let convicts break the horses. Most of the inmates are city bred, and none have had equine experience. In one year the convict-cowboy program has tamed more than 400 mustangs. Another 350 horses are corralled at the prison to be trained at the rate of about ten a day. Most are only halter broken, rather than readied for saddlework.

To become a cowboy, a prisoner must be near the end of his term: the horse corrals are outside the prison security system, and an inmate inclined to flee need only cross an alfalfa field and a low barbed-wire fence. No one has done so yet. Corral Boss Tony Bainbridge observes, "The meanest ones seem to make the best hands. You come out here and think you're a tough guy—we'll find out." He says, "A 900-lb. horse can move you around more than you expect."

Some men say they hope to use their new skills to get jobs as veterinarians' assistants or as hot-walkers and groomers at racetracks when they get out of prison. Veterinarian Ron Zaidlicz, founder of the National Organization for Wild American Horses, teaches the inmates how to groom and care for the horses. In 1985 Zaidlicz and other NOWAH members rode mustangs from Colorado to Washington to lobby for better protection of the wild horses. "I was asked why I cared about horses when people were homeless and in so much trouble," Zaidlicz gestured toward a knot of inmates intently working with a mustang. "In a way, this answers that."

—By James Willwerth/Cañon City







Ernest Paine and
Steve Wade, Cowboys,
Yerington, Nevada.

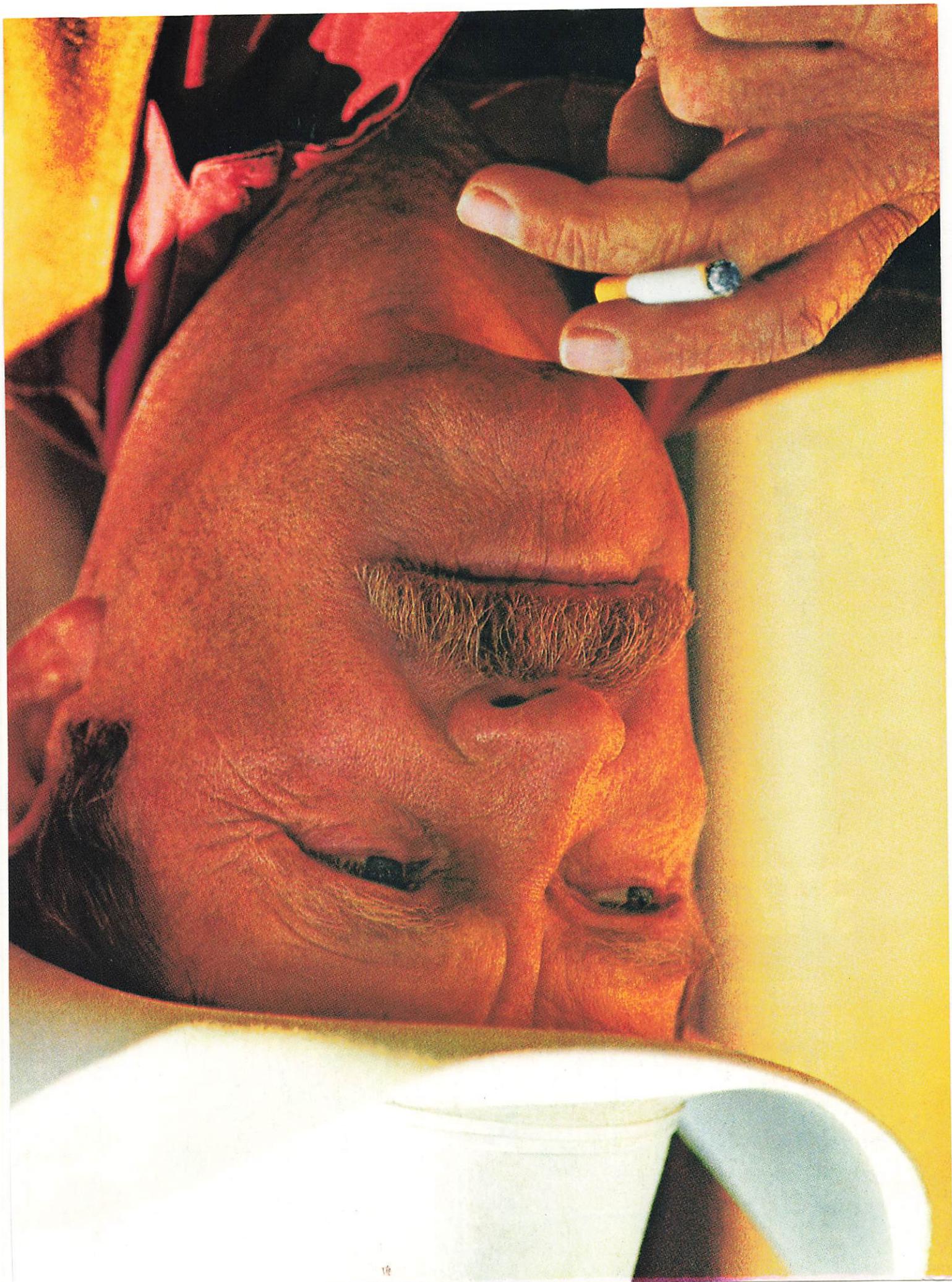
Twelve months a year, Steve Wade and Ernest Paine punch, brand and drive 2200 head of cattle across 500,000 acres of land. Without a discouraging word.



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Philip Morris Inc. 1989

ELECTRONICS

BY STEPHEN A. BOOTH

Direct-To-Disc Recording

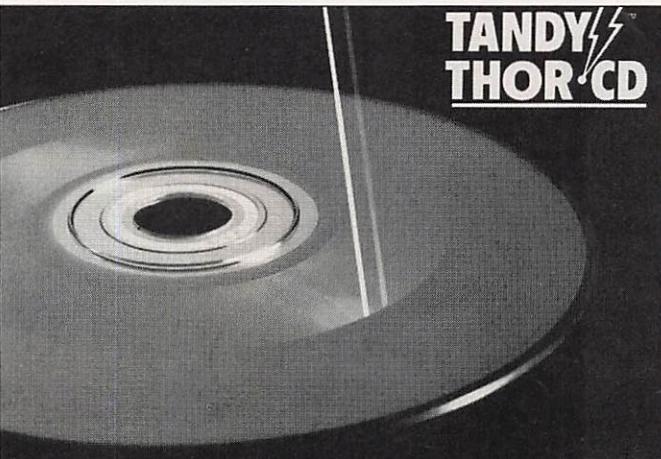
FOR THE TIME being, copyright issues are keeping digital audio tape (DAT) recorders out of circulation in the U.S. So let's discuss yet another digital recording format just over the horizon, namely, recordable compact discs.

Though it might come as a surprise to a generation brought up on Memorex, home recording predates the availability of open-reel tape decks in the 1950s. By the 1930s, amateurs armed with portable transcription phonographs were recording music and speech onto blank discs made of a soft acetate material. Many of these unauthorized "acetates," cut outside the confines of a studio, preserved for later generations the big swing bands and obscure folk musicians in live performances.

Magnetic tape, with its relatively convenient handling and longer recording time, has gained much greater popularity than the fragile, 3-minute acetates ever achieved. But with the advent of the digital audio compact disc—some 75 minutes long and physically robust—direct-to-disc home recording begins to appear practical again.

At the 1984 Tokyo Audio Fair, Sanyo demonstrated a prototype CD capable of putting 30 minutes of music on a blank disc. By the following year's fair, the prototype was up to 45 minutes of recording time.

CD recorders vanished from subsequent fairs as not-for-sale DAT decks hogged the limelight. Then, last spring, Radio Shack parent Tandy Corp. raised eyebrows when it announced its development of a CD-compatible recorder that could reach the market by 1990 at less than \$500. More recent-



You'll record digital compact discs at home with Tandy's THOR-CD.

ly, Japan's Taiyo Yuden unveiled a similar technology that the company states could be "reasonably priced."

Although Tandy and Taiyo Yuden have yet to describe their respective systems in detail, each has revealed enough to arrive at a basic understanding of the products and processes. The systems are alike in some ways, and different in others.

The most important shared characteristic is that discs recorded on the Tandy or Taiyo Yuden hardware conform to the Philips-Sony specifications for compact disc—meaning that they are compatible for playback on

any CD player. The key difference is that Tandy's recordable discs may be erased by the user and rerecorded many times. Tandy has reported as many as 40 recordings with no signal degeneration. Discs recorded by the Taiyo Yuden process cannot be erased and reused. In industry terminology, the permanently recorded Taiyo Yuden disc is called a CD-R. The erasable Tandy platter carries the CD-E acronym.

Both Tandy and Taiyo Yuden employ lasers to apply digital information to a recordable disc of the same 4 1/4 in. dia. of a prerecorded

CD. The newer 3-in. mini CDs also will be available as recordable blanks. Both companies use one of the three laser-optical recording processes that have been under development for this purpose—specifically, the one called pit-forming.

A conventional, prerecorded CD contains a microscopic spiral of depressions on the reflective surface beneath the clear, smooth coating of its playing side. The varying brightness of the light reflected back to the laser pickup from this irregular surface conveys the digital code of zeros and ones. In CD manufacturing, a laser etches the digital code on a glass master. Reflective replicates of this pattern, created by a metal (usually aluminum) deposition process, are sandwiched within the protective polycarbonate exterior of the CD.

The Tandy and Taiyo Yuden CD blanks also have a polycarbonate shell, but concealed within is a layer of chemical dye. When exposed to the on-off pulsing of a laser lightbeam more intense than that normally used for CD playback, the dye layer develops into a spiral pattern of depressions.

(Please turn to page 33)

Solid-State Digital Snapshots

Just as the first filmless, magnetic disk cameras are arriving in stores ("Electronics," page 42, Jan. '89), Fuji has added a new twist to all-electronic photography.

In place of the spinning magnetic disk used by Canon, Sony and others, Fuji's experimental DS-1P Digital Still Camera uses a stationary, 16-megabit memory card to store color images.

This credit-card size digital memory, jointly developed with Toshiba, enables the prototype point-and-shoot camera to store either five full-frame TV photos, or 10 photos in the single TV-field mode. According to Fuji, future versions of the memory card will accommodate up to 40 full-frame images. Current magnetic disk cameras hold either 25 full-frame or 50 single-field pictures.

Capacity aside, an advantage of the digital memory card is its lack of moving parts.

